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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p><b>(54) Title: DISPENSING MACHINE FOR FLUID PRODUCTS</b></p> <p><b>(57) Abstract</b></p> <p>A dispensing machine comprises a product dispensing station with a dispensing head comprising a first distribution centre in which a plurality of nozzles converges, one for each of the products of a series of products to be dispensed and at least a second distribution centre in which is converging a second plurality of nozzles, one for each of the second series of products to be dispensed. The second distribution centre is provided either on the first dispensing head or on a second dispensing head distinct from the first one.</p>			

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Dispensing machine for fluid products

The object of the present invention is a dispensing machine for fluid products, in particular but not exclusively for colorants and the like for the formulation of varnishes and similar according to the preamble of the principal claim.

This machine is mainly studied for the dispensing of two (or more) different series of products, for example, products using water as their carrier (herein after indicated as water-based products or colorants), products using various types of solvents as their carrier (herein after indicated as solvent-based products or colorants) or products using as their carrier fluids compatible with both water and solvents (herein after indicated as universal products or colorants). With the general term "products" it is understood to comprise colorants, pigments, inks, and also fluid basis for varnishes and similar of any of the three mentioned types. The present invention may nevertheless be used to handle and dispense various kinds of fluids other than those previously indicated, in many fields of the industry, for example in the food, chemical, pharmaceutical industries and many others.

In the known realisations, when you wish to dispense water and solvent based products with one single machine not a few problems arise which are frequently the cause of serious inconveniences. In fact, the known machines have either a plurality of moveable carousel canisters as to the distribution position and which are therefore enabled to dispense one single product at the time with a remarkable loss of time and productivity, or one single distribution centre in which the piping and all dispensing nozzles are converged, linked up to the respective dispensing members (pumps and dosing electrovalves). To avoid that, between one dispensing and the other, the products which are not frequently dispensed get dried, obstructing or however inhibiting the correct functioning of the corresponding dispensing centre, it is usually provided a nozzle humidifier device fitted to plug the corresponding distribution centre in order to maintain a status of saturated vapour at the outlet of the nozzles. For example, such device is described in the co-pending patent application no. MI96A000601 of the same

applicant. This humidifier device can be further connected to punching devices and cap-pluggers as described in the applicant's co-pending patent application no. BO95A000591. Moreover, it is possible to associate mechanical devices or other kinds thereof for the hole centring on the can into which the product is to be dispensed.

The water-based, the solvent-based or the universal products nevertheless have different drying times and it is thus possible that a humidifier device calibrated to avoid the drying of the water-based products does not result to be efficient enough to carry out the same task with the solvent-based or universal products and vice versa.

Moreover, the mixture between water-based, solvent-based and universal products is a potential pollution or contamination cause of the dispensed products. For example, drops may form at the nozzle of a product (for example solvent) which then are transferred into the container (can) destined to contain the dispensed product when a different product is dispensed (for example water) through the adjacent nozzle. The pollution or contamination that results from it can irreparably damage the paint altering both the chemical-physical and colorimetric characteristics.

Today, to avoid these inconveniences it is opportune and advisable to use two or more separate dispensing machines, one for each typology of product to dispense. However, the solution is too expensive for the medium-small customers, where dispensed quantities and/or available space do not justify the adoption of more than one dispensing machine. Moreover, this solution does not permit to obtain optimum productivity levels.

The problem at the heart of this invention is to provide a dispensing machine structurally and functionally conceived to enable the overcoming of all complained inconveniences with reference to the above mentioned known technique.

This problem is solved by the invention by means of a machine realised according to the appended claims.

The use of the present invention advantageously allows to duplicate (or multiply, depending on the actual number of dispensing heads and/or dispensing centres) the hourly production of a certain fluid product. In case of dispensation of coloured paints and varnishes and the like, the invention thus allows to produce at the same time two (or more) containers with the same coloured fluid or with different coloured fluids. Furthermore, the doubled or multiplied hourly production capacity is achieved without prejudice to the overall costs, because it is only needed a single machine bearing single computing unit and electronic control devices, the machine being easily integrated in a plant having a single conveying line or where limitation in space is a major concern. It also an advantage of the invention the fact that the delivery and shipping costs of the machine are comparable to those of a traditionally known machine of lower production capacity. A machine according to the present invention also requires no more than a single operator devoted thereto.

In the event that incompatible fluids are to be dispensed, as in the case of water-based and solvent-based products, it is possible to simply avoid any remotely possible contamination which might occur by dedicating each one of the dispensing heads or dispensing centres to each one of said incompatible fluids. This also contributes to eliminate any possible human error as far as the operator is concerned, since distinct dispensing members are clearly allocated which can also be physically marked, labelled or however unmistakably identified.

In the event that the fluid-receiving containers have small openings, small dispensing heads and/or dispensing centres are to be preferred. The present invention allows a user to split the fluids to be dispensed into two or more groups which converge to different and separated heads or centres, however retaining the advantages of a controlling the dispensing operations by means of a single control unit, processor and user interface.

Naturally, the principle of the present invention is applicable to many kinds of dispensing machines, including those specifically designed to handle dangerous fluids, such as those fluid which are flammable or explosive, these machine being known as "explosion proof" machines.

The characteristics and the advantages of the invention will result better from the detailed description that follows of a preferred example of a realisation illustrated, for merely indicative and non-limiting purposes, with reference to the attached drawings, in which :

- figure 1 is a schematic front view of a dispensing machine according to the present invention;
- figure 2 a side view of the same machine of figure 1;
- figure 3 is a schematic top view of the machine of the previous figures;
- figure 4 is a schematic enlarged scale view of one of the two distribution centres of the machine of the previous figures.

In the figures, reference numeral 1 globally indicates a dispensing machine which is realised according to the present invention. In an already known way machine 1 comprises a framework 2 with a dispensing head 3 that overtops a distribution area of one or more products in a liquid state in a container (R and R'). Associated with the machine there is a processing unit with a relevant user interface 4 with a video display 5 and a keyboard 6. This processing unit and the above mentioned accessories thereof are needed to control the plurality of dosing pumps all indicated by 7 and the relevant electrovalves 8 to dose the product distribution in a way which will be clarified here after.

The only dispensing head 3 is provided with a first and second dispensing centre 10a,b respectively structurally identical, but physically separate and at some

distance. Naturally, the structural details of the machine may vary widely within the framework of the present invention which also covers machines having a greater number of dispensing centres, the two or more dispensing centres being placed on either the same single dispensing head, or even on different dispensing heads. In turn, should the machine be equipped with more than one dispensing head, these heads may be placed at any distance the one from the others, lined on the front of the machine, as well as - according to alternative configurations and embodiments - one head on the front and the other on the rear side of the machine body, and more generally on opposite sides of the machine body.

In every dispensing centre 10a,b a respective plurality of nozzles 11 are converged, which are connected to the respective electrovalves 8 by means of pipings 12. The structure of each dispensing centre is known, for example the type described in the patent application no. MI96A000601, and preferably comprises a respective and independent support 13 for the nozzles 11 (in the example defined by the free extremities of the corresponding pipings 12) and a respective and independent humidifier device with relevant cap, altogether indicated with 14, of a known type. Moreover, each distribution centre can comprise a punching device and/or a plugging device of the type described in the co-pending patent application no. BO95A000591 in Italy, the content of which is hereby expressly incorporated.

In this way it is possible to dispense, by means of the single and common dispensing head 3, two or more different series of products, for example water- and solvent-based ones, through either the one or the other of the two dispensing centres 10a,b or even simultaneously, in two different containers, exploiting for the other functions the common resources of the same machine 1, included also the processing unit with the control system and the user interface.

In this way the invention solves the problem with a simple and compact machine, able to guarantee the non-pollution between dispensed products of a different

nature and also capable to protect in a optimum way the dispensing nozzles of products of different nature from possible drying of the dispensed product.

Moreover, it allows to dispense simultaneously the products of the same nature in the same container or simultaneously products of a different nature in two or various containers offering in this way a high productivity level without cost increase.

It is understood that it is likewise possible to equip the machine with further dispensing centres, within the limits set by the contingent needs and by the overall dimensions thereof.

CLAIMS

1. Dispensing machine for fluid products, in particular but not exclusively colorants and the like for the formulation of varnishes and similar, comprising a dispensing station for said products with a dispensing head comprising a dispensing centre for said products in which a plurality of nozzles converges, one for each product of a series of products to dispense, characterised by the fact that the machine comprises at least a second dispensing centre where a second plurality of nozzles converges, one for each of the second series of products to dispensed.
2. A machine according to claim 1, wherein the at least second dispensing centre is disposed on a second dispensing head distinct from the first dispensing head.
3. A machine according to claim 1, wherein the second dispensing centre is disposed on the first dispensing head.
4. A machine according to claim 1, wherein said distribution centres are structurally and functionally independent one from the other and reciprocally at some distance.
5. A machine according to claim 4, wherein for each of said distribution centres it is provided a separate support for the corresponding plurality of nozzles.
6. A machine according to claim 5, wherein for each of said distribution centres it is provided a separate humidifier device of said nozzles.
7. A machine according to claim 6, wherein said humidifier device of said nozzles comprises a punching device.

8. A machine according to claim 4, wherein for each of said distribution centres it is provided a separate humidifier, punch and plug device.
9. A machine according to claim 4, wherein for each of said distribution centres it is provided a separate can hole centring device.
10. A machine according to claim 1, wherein said distribution centres are controlled by and associated to one single control and user interface system.
11. A method for dispensing fluid products by means of a machine according to claim 1, wherein said distribution centres are activated in parallel to dispense simultaneously the respective products in a corresponding number of different containers.

FIG. 1

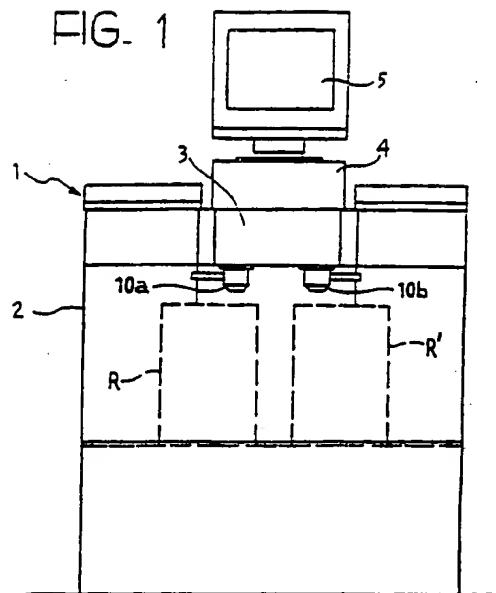


FIG. 2

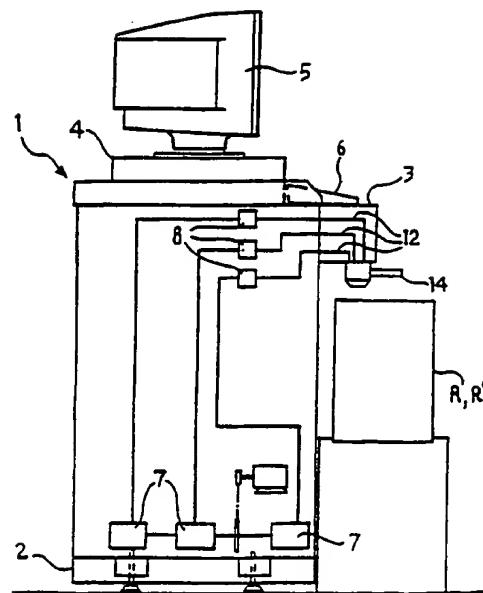


FIG. 3

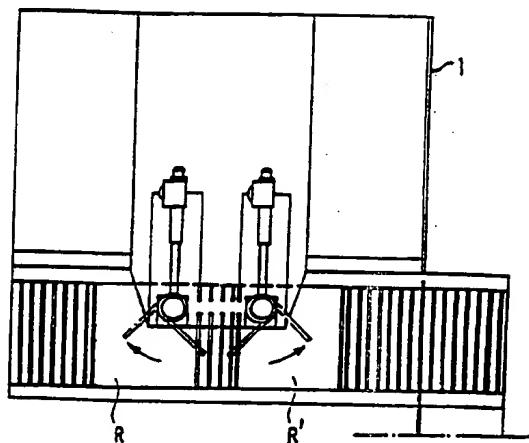


FIG. 4

